

#### REMARKS/ARGUMENTS

Claims 1 and 5-10 are pending in this application.

Claims 1 and 7 were rejected under 35 U.S.C. § 102(b) as being anticipated by Menzer (U.S. 3,137,601). Claim 5 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Menzer in view of Speakman (U.S. 6,503,831) and Aizawa et al. (U.S. 5,179,456). Claim 6 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Menzer in view of Speakman and Emerson (U.S. 3,353,895). Claim 8 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Menzer in view of Babb (U.S. 5,730,922). Claim 9 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Menzer in view of Speakman. Claim 10 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Menzer in view of Emerson and Arakawa (U.S. 2002/0060762).

Applicant respectfully traverses the rejections of claims 1 and 5-10.

Claim 1 recites:

A plastic substrate for use in optical instruments, the plastic substrate comprising:

**a composite substrate in which fibers are embedded in a resin matrix, the fibers being arranged to extend in two nearly orthogonal directions within a plane of the composite substrate; wherein the composite substrate substantially transmits visible radiation and has an in-plane retardation of substantially zero.** (emphasis added)

The Examiner alleged that Menzer teaches a composite substrate having fibers embedded in a resin matrix, the fibers being arranged in two nearly orthogonal directions within the plane of the substrate, and that the refractive index of the fibers matches the refractive index of the resin. The Examiner further alleged that optical in-plane retardation occurs when there are refractive index differences within the plane of the substrate, and since Menzer teaches that the refractive index of the fibers matches the refractive index of the resin, then the composite substrate of Menzer has an in-plane retardation of substantially zero.

Applicant respectfully disagrees.

Contrary to the Examiner's allegation, matching the refractive indices of the fibers and the resin does not necessarily lead to an in-plane retardation of substantially zero. Even though the fibers and the set resin of Menzer may individually have matching refractive indices, refractive index anisotropy (i.e., in-plane retardation) is produced photoelastically due to thermal stress caused by differences in the thermal expansion coefficient between the fibers and the resin. The magnitude of the stress depends on the photoelastic constants of the fibers and the resin, and on the thermal hysteresis of the composite substrate during the manufacturing process. Furthermore, the stress caused on the resin also depends on the density of the fibers and the thickness of the composite substrate (see, for example, page 19, line 11 through page 21, line 9 of Applicant's Substitute Specification filed June 7, 2005).

Menzer does not remotely teach or suggest that in-plane retardation of the finished composite substrate may be produced photoelastically due to thermal stress between the fibers and the resin.

The Examiner is reminded that a "claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." Verdegaal Bros. v. Union Oil Co. of California, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

Furthermore, the Examiner is reminded that the fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. In re Rijckaert, 9 F.3d 1531, 1534 (Fed. Cir. 1993) (reversed rejection because inherency was based on what would result due to optimization of conditions, not what was necessarily present in the prior art). "To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.' " In re Robertson, 169 F.3d 743, 745 (Fed. Cir. 1999). See M.P.E.P. § 2112.

Because Menzer does not recognize that in-plane retardation of the finished composite substrate may be produced photoelastically due to thermal stress between the fibers and the resin, Applicant respectfully submits that one of ordinary skill in the art would not have been motivated to modify the composite substrate of Menzer to have an in-plane retardation of substantially zero.

The Examiner is reminded that "[a] particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation." In re Antonie, 195 USPQ 6 (CCPA 1977) and MPEP §2144.05(II)(B).

Thus, Menzer fails to teach or suggest the features of "a composite substrate in which fibers are embedded in a resin matrix, the fibers being arranged to extend in two nearly orthogonal directions within a plane of the composite substrate" and "the composite substrate substantially transmits visible radiation and has an in-plane retardation of substantially zero," as recited in Applicant's claim 1.

Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejection of claim 1 under 35 U.S.C. § 102(b) as being anticipated by Menzer.

The Examiner relied upon Speakman, Aizawa et al., Emerson, Babb, and Arakawa to allegedly cure deficiencies of Menzer. However, Speakman, Aizawa et al., Emerson, Babb, and Arakawa fail to teach or suggest the features of "a composite substrate in which fibers are embedded in a resin matrix, the fibers being arranged in two nearly orthogonal directions within a plane of the composite substrate" and "the composite substrate substantially transmits visible radiation and has an in-plane retardation of substantially zero," as recited in Applicant's claim 1. Thus, Applicant respectfully submits that Speakman, Aizawa et al., Emerson, Babb, and Arakawa fail to cure the deficiencies of Menzer described above.

Accordingly, Applicant respectfully submits that Menzer, Speakman, Aizawa et al., Emerson, Babb, and Arakawa, applied alone or in combination, fail to teach or suggest the unique combination and arrangement of elements recited in Applicant's

claim 1.

In view of the foregoing remarks, Applicant respectfully submits that claim 1 is allowable. Claims 5-10 depend upon claim 1, and are therefore allowable for at least the reasons that claim 1 is allowable.

In view of the foregoing remarks, Applicant respectfully submits that this application is in condition for allowance. Favorable consideration and prompt allowance are solicited.

To the extent necessary, Applicant petitions the Commissioner for a TWO-month extension of time, extending to November 28, 2008 (November 27, 2008 falls on a Federal Holiday), the period for response to the Office Action dated June 27, 2008.

The Commissioner is authorized to charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 50-1353.

Respectfully submitted,

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